

REMARKS

It is noted that prior rejections of all claims (excepting claim 13) under 35 U.S.C. §103(a), applying Erickson et al. in view of Swei or Erickson et al. alone, have been withdrawn, that prior objections to the disclosure have been withdrawn; that 35 U.S.C. §112 rejections of claims have been withdrawn; and that certain prior 35 U.S.C. §102 rejections have been withdrawn.

The above cited action rejects claims 1-8, 12 and 16-18 under 35 U.S.C. §102(b) as anticipated by, or, in the alternative, obvious over Saam; rejects claims 1-3, 5-12, 14, 15, 17 and 18 as anticipated by, or, in the alternative, by Swei; and rejects claim 13 under 35 U.S.C. §103 as unpatentable over Swei in view of Erickson et al.

Responsive to such grounds of rejection, Applicant respectfully submits the following points for the Examiner's consideration.

The present invention, as recited in product claims 1-11 and method claims 12-18 is something completely different -- a material with a hardness of ≥ 10 Gpa coated with a polysiloxane layer. This layer avoids or reduces high capillarity of the hard material in relation to low-viscosity fluids as well as diffusion of light when covering the hard material with a lacquer or a laminate layer for improving wear resistance.

USP 4,244,849 (Saam) relates to an aqueous silicone emulsion which is turned into a stabilized, aqueous emulsion of a polydiorganosilosane with an end-portion hydroxyl group by adding an alkali silicate metal. After removal of the water phase (even at room temperature) this emulsion is able to provide an elastomeric product. The elastomeric product is formed due to a network established by the alkali silicate with polydiorganosiloxane via a functional end-portion hydroxyl group of the polydiorganosiloxane.

As noted above, the presently claimed invention provides elastomeric layers. These layers may also contain additional fillers (see col. 7, line 21) for the purpose of strengthening, elongating or dying the layers. The product and method of the present invention differ from Saam in several respects.

a) Hardness of fillers

It is not correct to compare the hardness of the fillers in the sense of Saam with hard material of the present invention. Among the fillers referred to in col. 7, lines 21-27 of Saam, quartz may well be the hardest one, having a $HV_{0.2}$ = about 9.5 Gpa. Saam's group of fillers as a whole are of a different class than those contemplated herein. Alumina (aluminum oxide) of Saam's group is considerably softer than and is not to be confused with α -alumina (corundum). Any person of average skill in the art who wishes to provide an elastomeric product in the form of a layer following Saam would find it obvious to take

alumina and more particularly the alumina described in the 3rd example of Saam, not corundum or the like.

In the present invention hard material having a hardness of $HV_{0.2}$ equal to or greater than 10 Gpa (all claims), preferably better than 15 Gpa (claim 2, etc.). The fillers referred to in Saam do not meet such limitation or suggest the subject matter of the claims.

b) Polisiloxane type

Another difference between the presently claimed invention and Saam is that in the latter a polysiloxane having functional end-portion groups as polydiorganosiloxane is used which then forms a network with alkali silicate (polymerizes) thus forming the elastomer. In the present invention a polydiorganosiloxane in form of a silicone oil (not having any functional end-portion groups), is used. See, also, claim 6, in which R, defined as hydrogen, alkyl or phenyl group, is used as a creeping substance for filling capillaries and pores and to moisten edges. Re lack of functional groups, the polysiloxane used in the present invention does not have any specific reactivity.

Consequently the end product of the present invention is a completely different layer. A filler, covered with an elastomer pursuant to Saam, could not be used in the sense of the present invention, even if it had a sufficient hardness.

c) Quantitative ratio

Apart from the above, the different goals of Saam and the present invention require completely different compositions. According to Saam, an elastomer layer so produced, optionally, can have fillers can be inserted into it. The quantitative ratio between filler and elastomer is clearly in favor of the elastomer, as may be gathered from the 3rd example of Saam where 75 g calcined alumina are added to 200 g polymer emulsion. Any material having such a layer – even if it was the intended layer and if it was a hard material in the sense of the present invention – would not be suitable in the sense of the present invention.

According to the present invention as set forth in claims 9-11, it is preferred to have 0.001 and 10% in weight (more preferably 0.01 to 5% in weight and most preferably 0.1 to 1.5% in weight) in relation to the hard material.

d) Single grid

The hard material coated in accordance with the present invention consists of single grids, which are used in this very form. In Saam, there is a polymer matrix into which fillers are inserted.

USP 5,182,173 (Swei) differs from the present invention in that a polysiloxane composite material is used herein. In Swei, a mono-functional polysiloxane, together with a multi-functional silane is turned into a multi-functional polysiloxane. A network agent is added to turn the material into a reactive high-polymer silicone network with which the filler

is coated. The coating is hardened as a silicone elastomer. The high-polymer silicone network of Swei will not fulfill the function of the silicone oil (not having any reactive functional groups) which is used as a creeping substance in the present invention.

Regarding hardness, it should be noted as discussed above in connection with Saam, that if an artisan tries to produce a filler material following Swei, it would not be reasonable to use hard material having a hardness of $HV_{0.2} \geq 10\text{GPa}$ or even $> 15\text{ Gpa}$. It is not correct to suppose that the fillers listed in the Swei patent do meet the hardness requirements according to the present invention. Rather, a person skilled in the art would suppose that the hardness of all fillers referred to in this document is considerably below 10 Gpa. Amorphous fused silica (Harbison-Walker GP-71) (see col. 7, lines 56-60) is the filler preferred in Swei. The hardness of this filler is about 6 Gpa.

One further difference is that the filler of Swei needs to contain hydroxyl groups as functional groups, so that it may be connected to the reactive polysiloxane which comprises functional groups.

Hard material of the present invention has an inert surface without any functional groups. The person of ordinary skill in the art would not find them suitable as fillers in the sense of the present invention, since persons skilled in the art know that material having a hardness exceeding 10 Gpa usually lack functional groups on their surface. This, however, allows the reverse conclusion that the fillers of Swei are not the hard material in the sense of the present invention.

USP 5,645,619 (Erickson et al.) with USP 5,182,173 (Swei) are not properly combinable to meet the presently claimed invention. Erickson et al. describe the production of a sol-gel abrasive grain. A dispersable SiO_2 compound is added to a boehmite sol and to a precursor compound for Fe_2O_3 . The sol produced this way is gelled, dried, calcined, and sintered. Calcination is done at $400 - 1000^\circ\text{C}$. This and the fact that in both cases abrasive grains are referred to are the only things the two references have in common. As mentioned above, the Swei disclosure is directed towards something completely different. There is no indication at all, in either reference, as to how the person skilled in the art should discern the present invention when combining the disclosures of Erickson et al. and Swei.

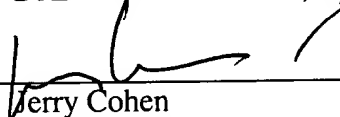
It is therefore submitted that claims 1-18 are allowable and notice thereof is requested.

If any questions remain, please call Applicant's attorney, collect, at the number given above. If any sums are owed due to claim adjustments, please debit or credit Deposit Account 03-2410, order 12707-3.

Respectfully submitted,
DANIELE CASALINI, Applicant

Dated: April ⁷~~4~~, 2003
K

By:


Jerry Cohen
Reg. No. 20,522
Attorney for Applicant